The volume bears no date on title-page, or elsewhere where a date is naturally looked for, though the date 1917 appears under the state printer's name. Its publication appears to have been delayed, as so many other volumes have been in recent years.

R. D. S.

Petroleum and Natural Gas in Indiana. By W. M. LOGAN, State Geologist. Fort Wayne: The Department of Conservation, Division of Geology, 1920. Pp. 279.

Like the preceding, this volume appropriately discusses the general fundamental questions concerning the origin and accumulation of oil and gas, and methods of finding it (pp. 10–48). A summary of the stratigraphy of the state (pp. 50–62) is followed by reports on the several counties. A map showing the oil and gas areas of the state accompanies the report.

R. D. S.

The Sand and Gravel Resources of Missouri. By C. L. DAKE. Rolla: Missouri Bureau of Geology and Mines. Vol. XV, 2d ser. (1918). Pp. xii+274, 17 plates.

A useful volume, dealing not only with the geological phases of the subject, but with the industrial phases as well. It is not restricted to surface sands and gravels, but includes available materials of these types in formations from the Cambrian up. Incidentally the volume presents a brief, up-to-date summary of the stratigraphic succession of the state, which is welcome and useful. The volume should be of value to those engaged in most sorts of construction work, both now and in the future, as well as to geologists.

R. D. S.

The Physical Features of Anne Arundel County. By HOMER P. LITTLE and OTHERS. Baltimore: Maryland Geological Survey, 1917. Pp. 232, pls. 9.

This county report covers the physiography, geology, mineral resources, soils, climate, magnetism, and forests. The county lies in the coastal plain, and formations older than the Cretaceous therefore are wanting. One of the striking features of the geology of the region is the large number of unconformities in the Coastal Plain series. There

are, for example, seven Cretaceous formations, each bounded above and below by an unconformity. Much the same may be said of the later formations. The Cretaceous strata of the region have a total thickness of 720 feet, the Eocene, 160 feet, the Miocene, 100 feet, the Pliocene (?), 40 feet, and the Pleistocene about 100 feet.

R. D. S.

Onaping Map-Area. By W. H. COLLINS. Ottawa: Canadian Geological Survey, Memoir 95, 1917. Pp. viii+157, pls. 11, figs. 8, map.

A very concise report on the geology of an area of approximately 3,500 square miles the center of which is 50 miles north of Sudbury. The area lies within the southern part of the pre-cambrian shield and its topography is that of a hummocky plateau 875 to 1,450 feet above the sea. The most important physiographic features antedate glaciation. The two intersecting series of parallel lake basins, in the southwest quarter of the area, probably follow faults.

The solid rocks, all pre-Cambrian, are separable by a great unconformity into a pre-Huronian group and a Huronian group. The pre-Huronian consists of a schist-complex and intrusive granite-gneisses. The schist-complex consists of volcanics and subordinately of water-deposited tuffs, iron-formation, and other sediments. The structure of this schist-complex, wherever determinable, is that of low anticlinoria and synclinoria. Dynamic metamorphism has converted the original volcanics and sediments into chlorite and sericite or paragonite schists. Near the granite-gneiss batholiths the effects of contact metamorphism are very marked. This schist-complex represents a period of extensive vulcanism and the formation of shallow-water or land deposits. The intrusive granite-gneiss series is dominantly granodiorites with which are associated a great variety of amphibolites, diorites, aplites, pegmatites, and other types. The diversity of types is explained by primary differences in the intruding magma, magmatic differentiation, and large-scale magmatic assimilation of older rocks. Crenulated interlocking contacts of larger mineral individuals with irregular shape and orientation are textural features very characteristic of these assimilated products. Good photomicrographs are shown to illustrate these features. In the future these criteria may prove of great assistance in determining this obscure type of metamorphic rocks.

The Huronian rocks constitute the Cobalt series, divisible into two parts. The lower part (Gowganda formation, 0–3,000 feet thick)